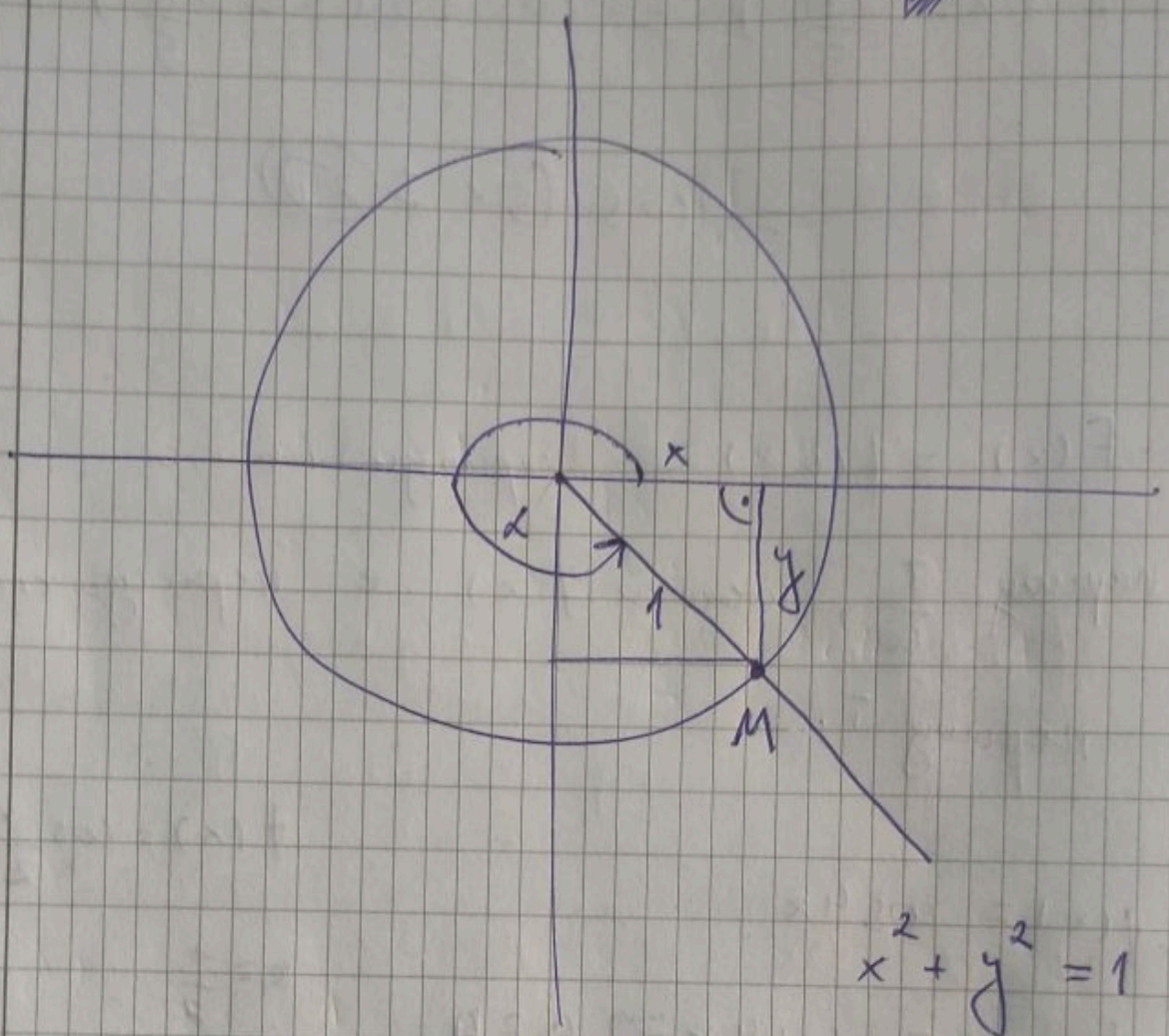
Т1: $\sin^2\alpha + \cos^2\alpha = 1$



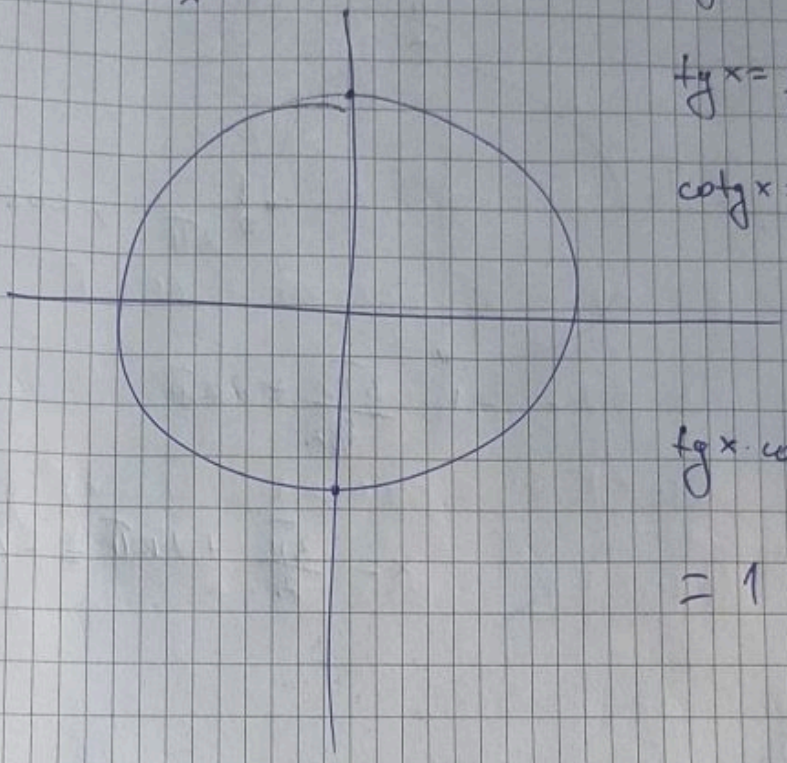
$x^2 + y^2 = 1$

$x = \cos\alpha$

$y = \sin\alpha$

T2:

$x \neq k\frac{\pi}{2}$ $\quad k \neq 0, 1, 2, \ldots$ $\quad tg\,x \cdot ctg\,x = 1$



$tg\,x = \frac{\sin x}{\cos x} \neq 0$

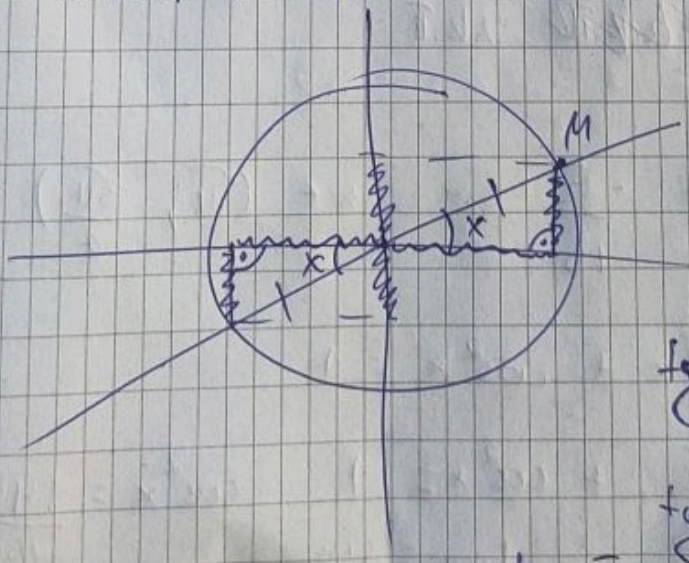
$ctg\,x = \frac{\cos x}{\sin x} \neq 0$

$tg\,x \cdot ctg = \frac{\sin x \cdot \cos x}{\cos x \cdot \sin x}$

$= 1$

T3:

$\sin(x+\pi) = -\sin x$



$\cos x = -\cos(x+\pi)$

$\cos(x+\pi) = -\cos x$

$\sin(x+\pi) = -\sin x$

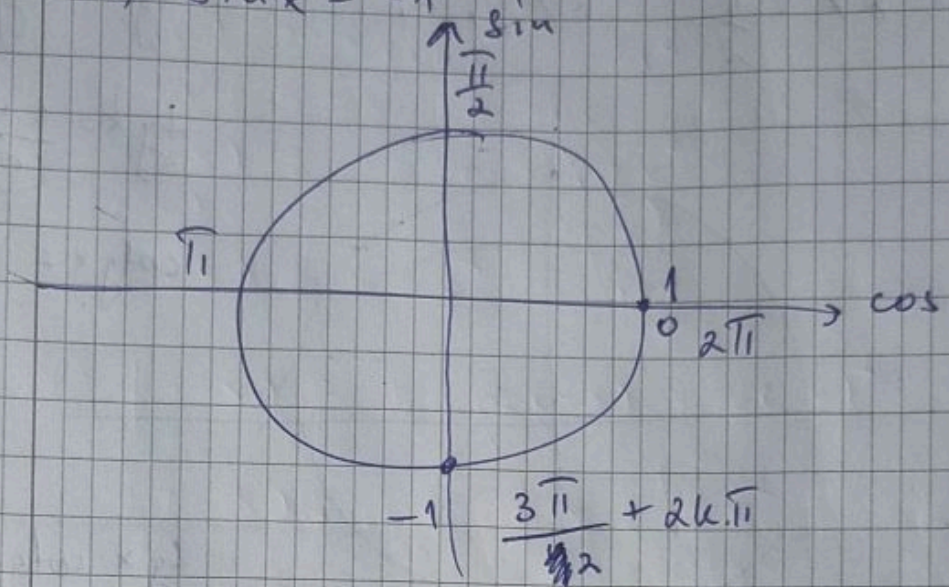
$tg(x+\pi) = \frac{\sin(x+\pi)}{\cos(x+\pi)}$

$tg(x+\pi) = \frac{-\sin x}{-\cos x} =$

$\Rightarrow ctg(x+\pi) = ctg\,x = tg\,x$

①

а) $\sin x = -1$



$\frac{3\pi}{2} + 2k\pi$

$x = \frac{3\pi}{2} + 2k\pi = -1$

б) $\cos x = 1$

$2k\pi$

② $\sin x = -\frac{5}{13}$ $\quad x \in (\pi; \frac{3\pi}{2})$

$\sin^2 x + \cos^2 x = 1$

$\frac{25}{169} + \cos^2 x = 1 \quad \cos^2 x = \frac{144}{169} \Rightarrow \cos x = \pm\frac{12}{13}$

$x \in (\pi; \frac{3\pi}{2})$.

$\Rightarrow \cos x < 0$

$tgx = \frac{\sin}{\cos} \Rightarrow tg = -\frac{5}{13} \cdot \frac{13}{12} = +\frac{5}{12}$

$$\operatorname{ctg} = \frac{\cos}{\sin} = -\frac{12}{13} : \frac{13}{-5} = \frac{12}{5}$$

①

$$f(x) = 5\cos x + 3x^2$$

$$f(-x) = -5\cos x + 3x^2$$

$$f(-x) = 3x^2 - 5\cos x$$

$$f(-x) = 5\cos(-x) + 3(-x)^2$$

$$f(-x) = -5\cos x + 3x^2$$

$$f(-x) = 5\cos(-x) + 3(-x)^2$$

$$f(-x) = 5\cos x + 3x^2$$

②

$$f(x) = x^4 + 3x\sin x$$

~~$f(-x) = x^4 - 3x\sin x$~~

$$f(-x) = x^4 - 3x \cdot -\sin x$$

$$f(-x) = x^4 + 3x\sin x$$

③

$f(x) = 3x^4 + 2x + tgx$

$f(-x) = 3x^4 - 2x - tgx$

$f(-x) = 3x^4 + 2x + tgx$

④

$f(x) = 5x^2 - 3x\ cotgx$

$f(-x) = 5x^2 + 3x - cotgx$

$f(-x) = 5x^2 \neq 3x\ cotgx$

⑤

$f(x) = 5x - 2\ sinx$

$f(-x) = -5x - 2 - sinx$

$f(-x) = -5x + 2sinx$

$f(-x) = -(5x \neq 2\ sinx)$

⑥

$f(x) = 7x + 3tgx$

$f(-x) = -7x - 3tgx$

$f(-x) = -(7x + 3tgx)$

⑦

$f(x) = 2x + \sin x - cotgx$

$f(-x) = -2x - \sin x + cotgx$

$f(-x) = -(2x + \sin x - cotgx)$

⑧

$f(x) = -3x + 2\sin x$

$f(-x) = 3x - 2\sin x$

$f(-x) = -(-3x + 2\sin x)$